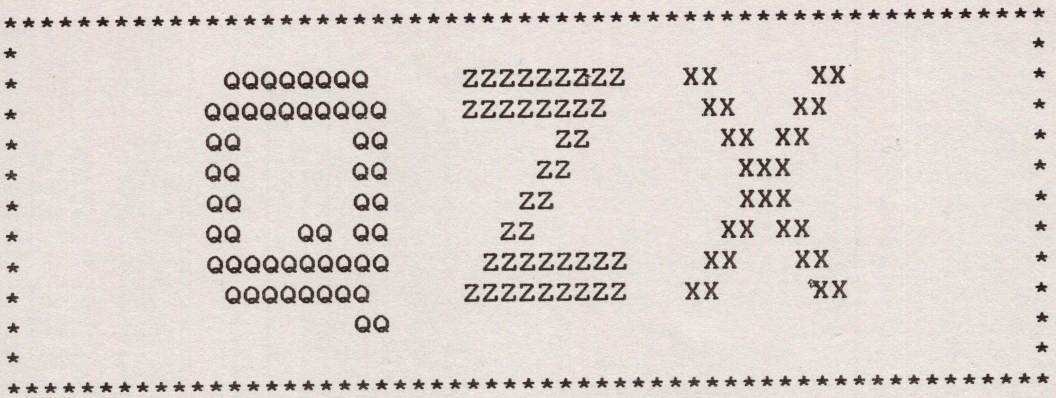

The Journal Covering Amateur Radio & Sinclair Computers
ZX-80; Micro-Ace; ZX81; T/S 1000, 1500, & 2068; QL
2025 O'Donnell Drive
Las Cruces, New Mexico
88001

K5XY
Alex. F. Burr
Publisher

W4GHV
Bo Barry
Editor

Volume 5 Number 9 ($1.50-issue) August 1987

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* Our Computers In Portugal, K5XY
* The T/S 2068 On Packet
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* Equipment Specials
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* Notes on the PC8300 Computer, Fred Nachbaur

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DX Heading Program
Roy Lawrence, W1EFK

Here's a rather nice program that allows you to find the proper beam antenna heading for contacts with your foreign friends! It even tells you how far away they are in case you have the urge to travel. I think it is a rather nice program and we are very glad Roy - W1EFk sent it to us. Here are his comments on how to run it:

DON'T use "SAVE", "RUN", "CLEAR", or start a new listing, unless you want/intend to clear out ALL the prefix data stored. DO use the menu when displayed or use GOTO 6 to resume if stopped. To change to your local latitude and longitude exit via menu option 4, LIST 4200, then change lines 4211 and 4212 to your latitude and lines 4224 and 4225 to your longitude, then enter GOTO 6. To save a new version with added data, etc., exit via option 4, prepare your recorder to record, then hit C. A new copy will then be recorded. Another comment- listing of the prefixes only shows the first 60. Resolution of this quirk is being worked on. The data for over 200 countries can be stored with the program, the data being obtained from the ARRL Antenna Handbook. It takes over 5 minutes to load and it is for a ZX81/TS1000 with 16K. Following is a typical printout and the listing.

Typical Printout

```
          ADD ITEM TO INVENTORY
               *********
WHEN  YOU  WISH  TO  END  NEW  ENTRIES   TYPE
"RETURN"

IF  "5/??" APPEARS IN LOWER LEFT CORNER  TYPE
"C" TO CONTINUE
NO.   PREFIX      LAT.       LONG.
1     A2          -22        -25
2     A3          -21        175
    etc.
        ******BEARING IS ******
VK6               COUNTRY
252.3             DEGREES
72.3              LONG PATH
       ******THE DISTANCE IS *****
18163             KILOMETERS
9809              NAUTICAL MILES
11267             STATUTE MILES
```

```
6 PRINT TAB 7 "********************
7 PRINT TAB 5 "DXCC-BEARINGS-DISTANCE"
9 PRINT TAB 7 "********************
15 PRINT
20 PRINT "DO YOU WANT TO:"
25 PRINT
30 PRINT TAB 2 "1) START A NEW LIST?"
40 PRINT TAB 2 "2) SEARCH FOR A COUNTRY?"
70 PRINT TAB 2 "3) ADD NEW COUNTRY?"
86 PRINT TAB 2 "4) EXIT PROGRAM?"
92 PRINT "ENTER YOUR CHOICE 1-4"
96 INPUT A
99 CLS
100 IF A = 1 THEN GOTO 300
110 IF A = 2 THEN GOTO 3000
130 IF A = 3 THEN GOTO 900
140 IF A = 4 THEN GOTO 2000
160 GOTO 90
300 PRINT TAB 3 "START A LIST"
301 PRINT "******************"
302 PRINT
304 PRINT "HOW MANY ITEMS ARE TO BE LISTED?"
305 DIM I$(325,11)
307 DIM Q(325)
308 DIM R(325)
310 INPUT N
315 CLS
322 PRINT
324 PRINT "ITEM"
326 PRINT TAB 1;"NO."
332 FOR B = 1 TO 325
334 PRINT TAB 2;B;" ";
340 PRINT "PREFIX?"
350 INPUT I$(B)
355 PRINT I$(B)
360 PRINT TAB 5;"LAT?"
361 INPUT Q(B)
362 PRINT Q(B)
365 PRINT TAB 5;"LONG.?"
366 INPUT R(B)
367 PRINT R(B)
370 LET X = B
375 IF X = N THEN GOTO 390
380 NEXT B
390 CLS
400 PRINT "IF""5/???""APPEARS IN LOWER LEFT
    CORNER TYPE ""C"" TO CONTINUE LISTING"
402 PRINT
410 PRINT "NO.";TAB 5;"PREFIX";TAB
     16;"LAT.";TAB 24;"LONG.";
420 FOR B = 1 TO 325
430 PRINT TAB 0;B;TAB 4;I$(B);TAB 16;Q(B);TAB
    24;R(B)
440 LET X = B
```

```
455 IF X = N THEN GOTO 470
460 NEXT B
470 PRINT
471 PRINT "END OF FILE"
472 PRINT
475 PRINT "TYPE ""1""TO RE-DO LIST,""2"" TO
    RETURN TO START"
480 INPUT P
482 CLS
485 IF P = 1 THEN GOTO 300
490 IF P <> 1 THEN GOTO 6
900 PRINT TAB 6;"ADD ITEM TO INVENTORY"
901 PRINT "**************************"
902 PRINT
903 FAST
906 PRINT "WHEN YOU WISH TO END NEW ENTRIES
     TYPE ""RETURN"""
910 PRINT
920 PRINT "IF""5/???""APPEARS IN LOWER LEFT
    CORNER TYPE ""C"" TO CONTINUE"
925 PRINT
930 PRINT "NO.";TAB 5;"PREFIX";TAB
     16;"LAT.";TAB 24;"LONG.";
935 PRINT
940 FOR B = 1 TO 325
950 PRINT TAB 0;B;TAB 4;I$(B);TAB 16;Q(B);TAB
     24;R(B)
960 LET X = B
965 LET G = N
970 IF B = 325 THEN GOTO 1000
980 IF X = N THEN GOTO 1040
990 NEXT B
1000 PRINT "SORRY, FILE IS FULL"
1010 PRINT "TYPE ""C"" TO RETURN TO START OF
      PROGRAM"
1020 STOP
1030 GOTO 6
1040 LET B = B + 1
1045 LET N = B
1048 IF G = B THEN GOTO 1000
1050 PRINT
1060 PRINT "ITEM NO.";B
1070 PRINT TAB 3;PREFIX?";
1080 INPUT C$
1081 PRINT C$
1082 LET I$(B) = C$
1084 IF C$ = "RETURN" THEN GOTO 1120
1090 PRINT TAB 3;"LAT.";TAB 3;"LONG."
1100 INPUT Q(B)
1101 PRINT Q(B)
1103 INPUT R(B)
1105 PRINT R(B)
1110 GOTO 1040
1120 CLS
1125 LET N = B - 1
1130 GOTO 6
1500  PRINT "TYPE ""S""TO SAVE""D""TO  DELETE
      ""T""TO TERMINATE"
1520 FAST
1580 LET X = 1
1590 FOR B = X TO 325
1600 IF I$(B)="" THEN GOTO 1710
1610 LET Y = B
1615 LET X = B
1618 LET Z = B
1620 PRINT TAB 3;I$(B);" ";
1630 INPUT Z$
1635 PRINT Z$
1640 IF Z$="S" THEN GOTO 1710
1650 IF Z$="D" THEN GOTO 1800
1660 IF Z$="T" THEN GOTO 1675
1665 CLS
1670 GOTO 1520
1675 CLS
1680 GOTO 6
1710 IF B = N THEN GOTO 1730
1720 NEXT B
1725 PRINT
1730 PRINT
1735 PRINT "END OF FILE"
1740 PRINT
1750 PRINT "TYPE ""1""IF YOU WISH TO  DELETE
     OTHER ITEMS, TYPE ""2"" TO RETURN TO
     START OF PROGRAM"
1760 INPUT W
1765 CLS
1770 IF W = 1 THEN GOTO 1500
1780 IF W <> 1 THEN GOTO 6
1800 LET I$(B) = ""
1810 LET Q(B) = 0
1812 LET R(B) = 0
1815 IF N = B THEN GOTO 1920
1820 FOR B = Y TO 325
1830 LET I$(B) = I$(B+1)
1835 LET Q(B) = Q(B+1)
1836 LET R(B) = R(B+1)
1840 IF Z = B THEN GOTO 1900
1850 NEXT B
1900 LET N = N - 1
1908 LET B = X
1909 IF N = B THEN GOTO 1730
1910 GOTO 1590
1920 LET N = N - 1
1930 GOTO 1730
2000 PRINT "YOU HAVE INDICATED YOU WISH TO
     EXIT THIS PROGRAM"
2005 PRINT
2010 PRINT "IF YOU HAVE MADE ANY CHANGES"
2012 PRINT
2013 PRINT "****************************"
```

```
2015 PRINT "DO NOT FORGET TO RE-LOAD TAPE"
2016 PRINT "*****************************"
2017 PRINT
2018 PRINT "TO SAVE THIS PROGRAM AS CHANGED
      PREPARE THE TAPE RECORDER, BEGIN
      RECORDING, AND TYPE ""C"""
2020 STOP
2030 SAVE "DX.BEARINGS"
2040 GOTO 6
3000 PRINT TAB 7;"TO SEARCH FOR A COUNTRY
      ENTER THE PREFIX OF THE COUNTRY"
3010 PRINT "*****************************"
3020 PRINT
3030 PRINT "TYPE PREFIX"
3035 FAST
3040 INPUT C$
3042 LET J = LEN C$
3044 DIM M$(325,J)
3048 FOR B = 1 TO 325
3052 LET M$(B) = I$(B)
3068 IF C$ = M$(B) THEN GOTO 3100
3070 NEXT B
3075 PRINT
3080 PRINT "**NOT IN LIST**"
3090 GOTO 3122
3100 PRINT
3110 PRINT "LAT.";Q(B);,"LONG.";R(B);
3114 PRINT
3115 PRINT TAB 5;C$
3119 PRINT "LOCATED"
3120 CLS
3121 GOTO 4160
3122 PRINT
3124 PRINT
3130 PRINT "TYPE ""1""TO SEARCH ANOTHER
      PREFIX,""2"" TO RETURN TO START"
3140 INPUT U
3145 CLS
3150 IF U = 1 THEN GOTO 3000
3160 IF U <> 1 THEN GOTO 6
4160 LET D = 1
4162 LET K = 111.11
4163 LET M = 57.29577951308238
4164 LET N = 60
4165 LET S = 69.041
4200 IF D <> 1 THEN GOTO 4230
4211 REM LAT. IS NORTH FLA.
4212 LET A = 28.25
4215 LET A = A/M
4224 REM LONG. IS NORTH FLA.
4225 LET L1 = 32.72
4230 LET L2 = R(B)
4231 LET B = Q(B)
4236 LET B = B/M
4250 LET L = (L1-L1)/M
4260 LET E =(SIN A*SIN B)+COS(A*COS B*COS L)
4270 LET D = -ATN (E/SQR (1-E*E))+1.57079
4280 LET C = (SIN B-SIN A*E)/(COS A*SIN D)
4290 IF C >= 1 THEN GOTO 4310
4291 IF C <= 1 THEN GOTO 4302
4298 LET C = -ATN(C/SQR (1-C*C))+1.57079
4301 GOTO 4310
4302 LET C = 180/M
4303 GOTO 4310
4310 LET C = C*M
4312 IF SIN L >=0 THEN GOTO 4320
4315 IF SIN L <=0 THEN GOTO 4316
4316 LET C = 360 - C
4320 LET C = INT(C+.05)*10)/10
4321 LET J = C
4322 IF J <= 180 THEN GOTO 4326
4323 IF J >= 180 THEN GOTO 4328
4326 LET J = J + 180
4327 GOTO 4330
4328 LET J = J - 180
4330 PRINT "***BEARING IS:***"
4331 PRINT
4332 PRINT C$;"COUNTRY"
4333 PRINT
4334 PRINT C,"DEGREES"
4335 PRINT
4336 PRINT J,"LONG PATH"
4337 PRINT
4340 PRINT "***THE DISTANCE IS:***"
4345 PRINT
4350 LET X = K*D*M
4351 LET X = INT(X+.5)
4355 PRINT X,"KILOMETERS"
4356 PRINT
4360 LET V = N*D*M
4361 LET V = INT(V+.5)
4375 PRINT V,"NAUTICAL MILES"
4376 PRINT
4380 LET Z = S*D*M
4381 LET Z = INT(Z+.5)
4385 PRINT Z,"STATUTE MILES"
4387 PRINT
4450 PRINT "ENTER""1""FOR ANOTHER
     BEARING""2""TO RETURN TO START"
4455 INPUT U
4456 CLS
4457 IF U = 1 THEN GOTO 3000
4458 SLOW
4459 IF U <> 1 THEN GOTO 6
```

OUR COMPUTERS IN PORTUGAL

K5XY

When I was in Mexico City, I tried to

find some trace of our Sinclair computers. Some time ago we published a review of some Sinclair type computers which were supposed to be made in Mexico, but they apparently have sank without a trace.

My efforts in Portugal had quite a different result. There I saw more Timex and Sinclair computers than any other kind. Notice I said Timex and Sinclair not Timex/Sinclair. The corporate lineage of our computers is getting quite complicated, especially since Amstrand bought out Sinclair; but who makes them is not as important as what is being made. Let me tell you what I found for sale starting with the least expensive.

The least expensive was the Timex TC 2048. It was selling for about $160. It is really made by Timex in Portugal. It is sort of a reduced version of the T/S 2068. The keyboard is the chiclet type used on the T/S 1500 and is about the same size. That makes it smaller than the T/S 2068. The main feature left out is the cartridge port on the right hand side. It is a full color computer however. It has the same keys almost in the same arrangement as the ZX Spectrum +. It has fewer keys, which means that more of them are multifunction keys.

The ZX Spectrum+ was prominently offered for sale at about $170. The Spectrum+ is imported from Amstrand in Great Britain but is still called a Sinclair computer. The ones I saw may be part of the inventory Amstrand got when it bought Sinclair. The Spectrum+ has a keyboard which looks similar to the QL. The case is noticeably shorter and wider than the QL. It has several more keys than the T/S 2068 but is basically the same configuration.

The T/S 2068 was obtainable for a little over $180. I was unable to find out if the examples offered were new production from Portugal or inventory shipped over from the United States. All I can say is that the boxes were printed in English.

The ZX Spectrum+2 was being sold for about $285. This computer is much different than a Spectrum+, with a built in standard cassette tape recorder, although the recorder is the most obvious change. Another obvious change is the keyboard, which is similar to a standard typewriter. All the keywords like GOTO and RUN are completely missing. They will have to be spelled out. As compensation for this loss, one has a much more straightforward keyboard with far fewer multifunction keys. The various characters are still scattered in some pretty non-standard places. The space bar is there in its usual place but much shorter than standard. The overall size is about one inch shorter than the QL and about an inch wider.

The QL was for sale too. It was going for over $350.

Some particularly interesting Sinclair (Amstrand) and Timex accessories were also for sale. Sinclair was selling add-on wafer drives for the Spectrum computers which needed a special interface. Of greater interest, was a large disk drive unit being sold by Timex. This unit contained one 3 1/2 inch disk drive with a place for another one. It cost over $320.

I was able to read about the next computer (some consider it to be the last) in the Spectrum series - The ZX Spectrum+3. Basically it is a Spectrum+2 with a 5 1/4 inch disk drive instead of the tape recorder.

An intriguing little note appeared in one Sinclair computer magazine. The editors were trying to create a data base of the addresses of all who had tried out the Sinclair ZX88. Apparently Sinclair is not through with computers yet, but no details were given about this machine.

The magazines available were very revealing. It seems that the Sinclair machines (except for the QL) have become game machines. The magazines carry almost nothing except game reviews. Games are cheap and come in a wide variety. The store shelves were filled with many feet of cassette tapes containing games with almost no serious software. Games are apparently coming out so fast it is difficult to keep up with them; and, given the quality of many of the games, I saw no reason to keep up with them.

The magazine, Sinclair QL World, was well worth reading although one slim 60 page issue cost over $3.30. There was not a game review in the issue although many of the advertisers did offer good games for the QL.

Accessories were considerably more expensive than in the US. It was impossible to get any monitor for less than $100. Color monitors were almost twice as

expensive as cheap ones in the US. The QL printer was selling for about $390. There was a little price competition between stores with prices varying by about 2%.

All the stores selling Sinclair computers sold Amstrand ones too, but these were much bigger and more expensive machines. Many sold computers made by Phillips too. I saw no Commodore or Atari computers.

There were two plush stores selling Apple computers and one Computerland store with three IBM computers. I saw one store which specialized in IBM computers. These other stores were obviously selling only to businesses with a lot of money to spend.

It was good to see some popularly priced computers that people could afford and some stores which catered to real hobbyist users. Young people were attracted to these stores and one even had a bulletin board for communication between clubs and users so the computer scene is not completely taken over by businesses with money to spend.

(NOTE: HERE IS A TABLE)

T/S Computers for Sale in Portugal

Designation	Distributor	Price
TC 2048	Timex	$160
ZX Spectrum+	Amstrand	$170
T/S 2068	Timex	$180
ZX Spectrum+2	Amstrand	$285
QL	Amstrand	$320

All prices include 16% sales tax

The T/S 2068 on Packet

QZX has finally gotten the T/S 2068 on packet. Other of our readers have done it (see back issues), but this is the first time we have. You need a RS232 interface and a terminal program. Relatively inexpensive examples of each are sold by Grey and Clifford Computer Products (see ad in this issue). It is easy to get these products working. For complete reviews on using them for packet, see the next two issues of QZX.

QZX FRIENDS

W5GDL -- Chet says that rock hunting, camping, and his 10 year old grandson compete for the use of his computer.

SM0NCT -- Tommy sent in a subscription to put Sweden back on our country list. He said he subscribed to keep up with the activities of his good friend WA6DLI.

KA0REU -- VG has a ZX81 and thinks a lot of his T/S 2068.

K6USW -- Dar sent a list of his Sinclair equipment. At first glance it seems he has one of every type of Sinclair made. A close look shows however that he does not have a ZX80 (he does have a Microace though). On packet he is using a T/S 1500 with a Memotec RS232, 16k RAM, and T/S2040 printer connected to a Heath TNC.

W4DRM -- Perry apologized for renewing for only one year but said that, at age 75, his doctor had advised him not to start any continued stories. He says that he is one of the original subscribers who started with Marty Irons, K2MI, long before the present management took over. He has a ZX80 upgraded with 8k RAM. One of his several T/S 1000's is mounted on a board along with a tape recorder, a T/S2040 printer, a 12 TV, and an uninterruptible power supply. He operates it mobile and as a demonstration at radio club meetings. His main computer is a T/S 2068.

W6ISO -- Kit has finally up graded to a T/S 1500. He says the RAM wobbles are fewer and the satellite plots come up faster.

WA6OJJ -- Bob built the German Quad horizontal loop from the program in QZX and is getting 3 s units better reports than on his vertical on 40 meters.

VE7VL -- Val has had his T/S 1000 on VHF packet since the start of this year, using a Comlink 1, which he cannot praise too highly. He even picked up another couple of T/S 1000's recently so he could dedicate one just to packet.

Sinclair Monitor Battery Source
WA6DLI

Are you wondering how to power the small Sinclair TV set which can be used as a monitor now that Polaroid has quit making the Pola-Pulse and Pola-Pack batteries? (Or at least took them out of their catalog the dealers have.)

Here is information on how to get replacement batteries from those empty cartridges from you Polaroid 600 and Spectra cameras. If you carefully open the plastic

frame, you can extract the flat Polaroid battery, which is hardly used when just a pack of film has been shot. (Unless you let your film lie in the camera for two years at a time!)

This battery pack is very powerful and is 6 volts. Turn it over to see the cutouts in the cardboard where the round metal surface is exposed to make contact with the camera feelers. Holding the pack so the holes nearest the top edge are away from you, the right hole is plus (+), although not marked. Mark it now for reference.

You could make a holder with feelers to contact the two spots and a battery eliminator plug wired to the feelers, and operate transistor radios, small TV's like the LCD ones Radio Shack sells, or anything that runs on multiples of 6 volts. With diode protection, a back up for the ZX 81 or T/S 1000 to hold memory if power fails could be built.

Best of all, if you peel the cardboard away on the left or negative (-) contact about an inch, you can duplicate the pattern of the Pola-Pulse or Pola-Pack battery contacts and use the discard from the film pack in those applications that use the Pola-Pack, notably the Sinclair Pocket TV. You also trim the cardboard sides to the width of the narrow top piece! As long as you take pictures or know someone who does, you will have free batteries!

EQUIPMENT SPECIALS

This is a occasional column in which we will list some of the equipment in which we think our readers will be especially interested or which appear to be special bargains. If you have suggestions for items to appear here send them in. If you have comments on the items which appear here send them in too. The information here is as accurate and as complete as we can make it, but is listed here only as an indication as to what might be available. Any decision to purchase should only be made after further investigation.

ITEM	COMMENTS	$	ID
ZX81 Computer	only	$20	HT
MTERM II for T/S 2068		$30	EB
	advanced terminal software		EB
The Complete Guide to MTERM II	Booklet on MTERM II	$ 7	B.C.
TS2068	extra software inc	$120	EB
TS1500	complete	$50	SE
Keyboard kit for ZX81 etc		$15	EB
Computer Repair		varies	SE
EPROM	ZX80 to ZX81 almost	?	GR
I/O for all Sinclairs		$70	WO
QL hardware and software		varies	QC

--

ID Addresses

HT Hal-Tronix, Inc.
Box 1101 Dept QZX
Southgate, MI 48195
(313) 285-1782

--

EB E. Arthur Brown Co.
3404 Pawnee Drive Dept QZX
Alexandria, MN 56308
(612) 762-8847

--

B.C. Barry Carter
Box 614 Dept QZX
Warren, MI 48090

--

GR G. Russell Electronics
RD1 Box 539 Dept QZX
Centre Hall, PA 16828
(814) 364-1325

--

WO Thomas B. Woods
Box 64 Dept QZX
Jefferson, NH 03583

--

QC Quantum Computing
Box 1280 Dept QZX
Dover, NJ 07801

BITS AND BYTES

98. K7FG says that if you have an Apple INTRA monitor, (Jameco Electronics) that is not bright enough for your monitor modified T/S 1000, replace the 50k ohm miniature brightness control pot with a 1 Meg ohm miniature pot (75 cents at All Electronics Corp.). A new pot knob is also necessary (like their KNBP-120 for $1.00). Saw it short to fit the space.

99. The German Quad loop antenna program in the June issue of QZX uses color to separate

numbers in the readout. So, if anyone has a mono monitor, change lines 730 and 740 from TAB 4 to TAB 6. This will separate wavelength WV from frequency in the SWR tables.

100. KV3Q sent a wobble stopper for the Comlink I or Rampack. The wobble stopper consists of a small grommet which is glued to the center bottom of the accessory added to the computer. The extra thickness puts a small additional torque on the connection which helps to keep contacts between the units tight.

UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001

WANTED: Copy of Z-XLR8 program (high speed) with instructions. In return I will send a cassette with DXCC-ROTATOR CONTROL, CAT, SCANNER AND TERMINAL (all programs for the interface given in my articles in QZX). Send to Guillermo Garcia, LU8MAD, Cabildo 584, (5521) Mendoza, ARGENTINA.

Editor's Note

Fred's article below brought to mind a nice Z-80 Micro Reference Manual that I have been using in the Z-80 Assembly Language I teach at the University of North Carolina-Charlotte. It's a 4"x5 1/2" 34 pg booklet with complete instructions and hex codes for the Z-80. It has programming info for the peripheral devices also. I bought them for my class and have 4 left, in case someone is interested. Send $1.22 to Bo Barry- W4GHV, 8118 Kensington Lane, Harrisburg, NC 28075. If I run out and can't get more I'll return your buck. (I got them from TCMC, 1310 Electronics Drive, Carrolton, TX 75006, Mail stop 2205, attn Debbie, for a buck each.)

If you are into Z-80 programming and have a MS-DOS machine available, the Z80MU public domain emulator program is a must!! It will also allow you to run cp/m stuff if you are so inclined. If interested in it on a disk send me 75 cents.

PC 8300 Computer Info
Fred Nachbaur

Fred sent us a very informative letter concerning this computer. Alex had an article in QZX 5:6 and Fred sent some clarification.

As stated, the PC8300 is NOT a ZX81 clone. In fact, calling it "Timex compatible" is really pushing it. Though it does load TS BASIC programs, it is useless with every Timex machine code program of which I'm aware. The reason is that the memory map has been rearranged; the display file is now in a fixed position, at 407DH. The Timex D_FILE system variable now points to the start of the program area, AFTER the display files.

This is also why you can't load PC8300 programs into the Timexes. (The fault is not with Alex's "fussy" TS1500.) It will think that the display file is in the program area ... CRASH!

The character set is not quite the same as the ZX81. Some of the keyword tokens were moved, and others (such as to support the color pack) were added. More importantly, the grey/black and grey/white graphics are now right-triangles, the grey square is a race car (go-cart?) and (get this) the question mark, colon, and pound symbol are space-invaders! Sure makes some ZX81 displays look weird.

The ROM is completely different. Even the restarts are completely changed around, None of the ZX81 ROM calls will work, so even if you handle the problem of relocating your software, you'll still crash if you have a single ROM call in your code.

From a hardware standpoint, things are just as mixed up. True, the bus is "Timex compatible", to the degree that the ordinary Timex peripherals, and simple things like 8K NVM boards, can be used. However, some very important control lines (e.g. MREQ*, M1*, IORQ*) are not brought through, precluding the use of 64K packs. If these missing lines are added, most Timex hardware should work properly.

The character patterns are contained in the custom chip, not in the ROM. This is a mixed blessing; on the one hand, the entire region from 1E00-1FFF in the ROM is now free for additional code. Furthermore, the I register is now available for programmer use. On the other hand, it means that even a ROM upgrade cannot fix the goofy games characters. Also, I have yet to find a way to make the SCL release control of the data lines during refresh time, so that high-resolution graphics are possible. (Interestingly, the manufacturer claims hi-res capability, but after many hours of experimenting I can't for the life of me figure out how.)

Since the character patterns are in the custom chip, the printer routines are somewhat different. I/O is used to access the patterns! This suggests that there may be a port to turn off the whole business, but I haven't found it yet.

The reset key is kind of neat; it's a SOFT reset. If the machine already has a program in RAM, the RAM is not cleared. This makes it possible to break out of any program, even endless machine code loops. This feature was carried over into my Timex compatible ROM upgrade (more details to follow).

DO NOT try to plug a Timex ULA into the custom chip socket of the PC8300. At best it won't work, at worst you fry the chip and/or the computer. However, you CAN plug a Timex ROM into the 8300; it will work, sort of. In SLOW mode it's even worse; the whole display undulates like a belly-dancer on amphetamines. The reason is that the display hardware is different, requiring a complete re-write of the entire display system (RST 0038H, 0066H, and the whole stretch of code from 0207 through 02E6H.

I have successfully completed this re-write, and have a PC8300 that runs Hot Z, Memotext and Memocalc, Vu-Calc, Vu-File, Mazogs, etc., with a rock-steady display in both modes. The only programs it won't run are hi-res and quasi-hi-res, for the reason outlined above.

I also made it possible to successfully POKE the MARGIN variable. This lets you run it at 60 Hz or 50 Hz, without any hardware changes. Furthermore, you can poke it even higher to get a machine that runs up to well over twice as fast as "normal"! The only real limitation is your TV or monitors ability to lock into slower vertical scan rates.

The new ROM has some additional commands: REM 0 and REM 1 used to turn the blinking cursor on or off. (Otherwise, it still acts as before). A new BEEP command (on Function "V") turns the keyboard beep on or off. The new OUT command is used for output; e.g. OUT 255,3 sends a 3 to port 255. Similarly, the IN function is used for input; e.g. LET A=IN 245 can be used to make a click come from the speaker. Finally you can control I/O from BASIC!

PAUSE is now blinkless in SLOW mode. As mentioned, RESET first checks to see if there's a healthy display file present; if so, it leaves the program and variables completely alone, making it usable to "break" any program. One of the new ROM routines can be used by programmers to write music and sound routines.

The coup is a re-definition of STEP. It's still used as before in FOR-TO commands, but is now also a command of its own. It operates much like GOTO, except that it is used to single-step (trace) your program. For example, STEP 10 will bring line 10 into the edit lines; press any key, and the line is executed. The next line is brought down, and so on, until you press break or encounter an error during execution. Great for debugging. It can even be used within the program itself, so you can RUN the program to a given point (past long screen-fill loops, etc.) before the single-stepper takes over.

This new ROM will soon be available commercially. In the meantime QZX readers who send $5 and a blank 2764 EPROM will receive a development copy along with instructions on how to install it.

Regards,

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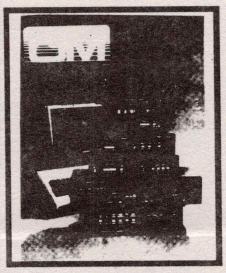

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